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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,867	10/14/2003	Horst Haussecker	21058/1206449-US1	6650
75172 Client 21058 c/o DARBY & DARBY P.C. P.O. BOX 770 CHURCH STREET STATION NEW YORK, NY 10008-0770				
EXAMINER				
LE, BRIAN Q				
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2624				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/685,867

**Applicant(s)**

HAUSSECKER ET AL.

**Examiner**

BRIAN Q. LE

**Art Unit**

2624

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 2, 4-6, 12, 13, 24-26 and 28-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-6, 12, 13, 24-26 and 28-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/29/8
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 12/29/2008 has been entered.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4-6, and 12-13, 24-26 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kley U.S. Patent No. 6,396,054 and Wickramasinghe et al. U.S. Patent No. 5,624,845.

Regarding claim 1, Kley teaches a method comprising:

a) alignment an object on a surface (column 16, lines 50-60 where object is positioning on the x,y plane (aligning object) on a surface (diamond coated surface) (column 16, lines 15-20));

b) imaging the object by at least two different modalities (different modes) of scanning probe microscopy (SPM) (column 2, lines 24-28) to obtain data for one or more properties of the object (metric measurements) (column 2, lines 50-51);

c) analyzing the data using a model-based analysis using one or more models of physical structures of known objects (topography) (column 4, lines 63-67);

c) estimating the values of one or more parameters from the data analysis (AFM and STM measurements) (column 10, lines 15-16); and

d) fusing the estimated parameters to form one or more fused parameters comprising a parameter-based characterization of the object (column 19, lines 20-50).

However, Kley does not explicitly disclose wherein an object can be a biomolecule, and aligning a biomolecule in a parallel manner on a surface by molecular combing and molecular combing comprises attachment of the biomolecule to the surface and alignment of the attached biomolecule by drawing the biomolecule through a moving meniscus.

Wickramasinghe teaches a method of aligning biomolecule (column 10, lines 55-57) in a parallel manner (a concept of inputting biomolecule in a fluid channels where electrodes are arranged in parallel to draw/control movement of biomolecule in parallel) (column 17, lines 25-35 and column 18, lines 57-65) on a surface by molecular combing (column 17, lines 38-40) and molecular combing comprises attachment of the biomolecule (column 10, lines 40-48) to the surface (column 17, lines 38-43) and alignment of the attached biomolecule (column 10, line 55) by drawing the biomolecule through a moving meniscus (column 15, lines 45-52).

Modifying Kley's method of aligning object according to Wickramasinghe would be able to aligning a biomolecule in a parallel manner on a surface by molecular combing and molecular combing comprises attachment of the biomolecule to the surface and alignment of the attached biomolecule by drawing the biomolecule through a moving meniscus. This would improve processing because it would improve the biomolecular code sequencing capability (column 2,

lines 5-25) and therefore, it would have been obvious to one of the ordinary skill in the art to modify Kley according to Wickramasinghe.

For claim 2, Kley teaches the method of claim 1, wherein parameter fusion is based on the model of the physical structure (gathering data/producing data) (column 19, lines 20-50).

Regarding claim 4, as disclosed in claim 1, Wickramasinghe also teaches the method further comprising identifying the biomolecule (detection of DNA) (column 3, lines 15-19).

For claim 5, as disclosed in claim 1, Kley discloses the method further comprising comparing the fused parameters with parameters determined from known biomolecule (as disclosed in claim 1, see Wickramasinghe) to identify an occurrence of a known biomolecule (topography)(column 4, lines 65-67).

Regarding claim 6, Kley (as discussed in claim 1) teaches the SPM imaging includes at least two modalities selected from the group consisting of scanning tunneling microscopy (STM) (column 2, lines 24-37).

For claim 12, as disclosed in claim 1, Kley also teaches the method further comprising known biomolecule structures (see Wickramasinghe) to obtain ranges of parameters for each type of biomolecule (column 13, lines 60-67).

Regarding claim 13, as disclosed in claim 1, Kley further teaches the method wherein the parameter ranges for known biomolecules are used in estimating the parameters (column 14, lines 25-32).

For claim 24, please refer back to claim 1 for teachings and explanations. In addition, Kley further teaches controller (FIG. 26, "controller", element 114) to control the operation of the scanning probe microscope, memory (FIG. 26, "memory", element 124) to include one or

more characterizations of known structures, and a surface for attachment (column 16, lines 15-20).

For claim 25, please refer back claim 5 for the teachings and explanations.

Regarding claim 26, Kley discloses the system wherein the characterizations of known structures are used to analyze a set of SPM images (column 4, lines 63-67 through column 5, 5-16).

For claim 28, please refer back to claim 5 for the teachings and explanations.

For claim 29, please refer to claim 1 for teachings and explanations. In addition, Kley further teaches step of analyzing images and reanalyzing the data (column 4, lines 63-67; column 7, lines 5-10; column 11, lines 60-67).

For claim 30, please refer back to claim 6 for further teachings and explanations.

3. Claims 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Kley U.S. Patent No. 6,396,054 and Wickramasinghe et al. U.S. Patent No. 5,624,845, as applied to claims 1 and 8 above, and further in view of Grand et al. "Epitaxial growth of copper phthalocyanine monolayers on Ag(111)", Surface Science, vol. 366, no. 3, 1 November 1996.

Regarding claim 8, Kley does not explicitly teach the method wherein the parameters are estimated by level set techniques, PDE (partial differential equation) techniques. Grand teaches the method wherein the parameters are estimated by level set techniques, PDE (partial differential equation) techniques (page 404, column 1, 3<sup>rd</sup> paragraph). Modifying Kley's method of utilizing scanning probe microscopy according to Grand would be able to use partial differential equation as an estimation tool in estimating parameters. This would improve processing and

therefore, it would have been obvious to one of the ordinary skill in the art to modify Kley according to Grand.

For claim 9, Grand also teaches a method further comprising embedding the techniques in a probabilistic estimation framework (Page 405, column 1, last 15 lines and page 406, column 1, 1<sup>st</sup> 15 lines).

Regarding claim 10, Grand teaches the method further comprising classifying the subject by applying vector quantization, support vector machines (FIG. 7). Modifying Kley's method of utilizing scanning probe microscopy according to Grand would be able to further classify fused parameter. This would improve processing and therefore, it would have been obvious to one of the ordinary skill in the art to modify Kley according to Grand.

Referring claim 11, Grand teaches the method further comprising using known biomolecule structures to generate training sets of data (page 405, 1<sup>st</sup> column, last 10 lines).

### ***CONCLUSION***

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN Q. LE whose telephone number is (571)272-7424. The examiner can normally be reached on 8:30 A.M - 5:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner can be reached on 571-272-7401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Brian Q Le/  
Primary Examiner, Art Unit 2624  
1/8/09